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Balancing the Natural and Built Environment

April 17, 2014

Rick Ware
President/Senior Marine Biologist
Coastal Resources Management
3334 East Coast Highway
Corona Del Mar, California 92625

Subject: Analysis of a Sand Sample for Invasive Weed Seeds, Beach Maintenance Project at Two Harbors, Catalina Island, Los Angeles County, California

Dear Mr. Ware:

This Letter Report presents the results of an analysis of a sample of sand material from the Lepeyre Industrial Sands Quarry, located in San Juan Capistrano, Orange County, California. The sands from this quarry will be used for beach maintenance at Two Harbors on Catalina Island, located in Los Angeles County, California. The objective of this study was to determine the presence of any seeds of invasive weed plants within the sands from this quarry, per the requirements of the County of Los Angeles.

A 2.5-gallon sample of this sand was provided to BonTerra Psomas for analysis on April 14, 2014. The sand was slightly damp and very clean in appearance. General visual observations noted no obvious evidence of any organic debris in the sand sample provided for analysis. The sand was then spread out on a large piece of paper to dry and to allow for the examination of the provided sample for the presence of any weed seeds.

The existing literature contains a number of references that detail some of the common procedures for separating seeds from the existing soils (Forcella et al. 2003, Hussain et al.1989, Mesgaran et al. 2007, and Morgensen et al. 2005). Generally, this involves separating the seed from the surrounding soil material by sifting or floating. Identification of weed seeds can be performed by using the exiting weed guides, which provide illustrations of their seeds (DiTomaso and Healy 2003, 2007) or manuals for seed identification (Martin and Barkley 1961; Davis 1993; Kirkbride et al. 2006).

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Methods

The determination of the potential presence of weed seeds within the sand, which was sampled from the Lepeyre Industrial Sands Quarry, utilized three techniques to separate any organic material (including seeds) from the sand sample (Mesgarian et al. 2007). These included a general visual examination of the sand material; sifting of the sand to separate out any potential organic or seed material; and suspending the sand in water or a Calgon solution to allow any organic material or seed to float to the surface. This investigation was conducted by David Bramlet, Botanist for BonTerra Psomas.

The first method was to visually examine the sand that had been spread on a table to dry. The material was initially inspected for any material that was not a mineral grain. This consisted of looking for contrasting colors and/or textures within the sand. Following the initial overview examination, a few small samples were examined under a dissecting microscope at 10X and later at 30X, to determine the presence of any organic particles or seeds within the sand grains.

The second procedure was to sift the sand, to allow for larger particles to be observed and collected following of the removal of the finer sand particles. A standard window screen was placed over a five-gallon bucket to serve as a sieve for the provided sand. Four 1-quart samples were then sieved over this screen and the sand was pushed through the screen by hand. For each sample, the larger sand particles were then placed on a sheet of paper and each resulting sieve was examined under a dissecting microscope at 10X and 30X to determine the presence of any organic particles or seeds.

The third method involved placing the sand into water or a Calgon solution so that the organic debris or seeds could float to the surface. Approximately 0.5-quart of sand was mixed with 1.5 quarts of water in 1 container, and a similar setup was developed in a second container along with Calgon powder being added to this mixture. The mixture was shaken so that all of the sand was suspended in the water or solution, and the containers were allowed to sit for about 2½ hours. The containers were then checked for the presence of any floating debris or seeds.

Results

No seeds were observed in the sample of sand provided from the Lepeyre Industrial Sands Quarry. In the first two techniques used to examine the sand particles, only mineral grains were observed from both the general observation of the sand provided and from an examination of the larger sand grains following the sifting of this material. In addition, no organic debris or seeds were found on the surface of the water or Calgon solution, in which the sand had been suspended.

Based on the provided sample of sand from the Lepeyre Industrial Sands Quarry, this sand is free of any noxious weed seeds.

BonTerra Psomas appreciates the opportunity to provide Coastal Resources Management with this analysis of the sand sample. Please contact me at (714) 444-9199 if you have any questions on this study.

Sincerely,
BonTerra Psomas

Ann M. Johnston
Vice President, Resource Management

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